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III. Remarks

Claims 17-32 and 34-43 are pending in the application. Claims 34-43 are newly presented.

Claim Rejections -35 USC §103

Claims 17-32 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Nachtman et al. (US 5,897,946).

The examiner states that Nachtman et al. teaches a composite coated particle and method of making the particle, where the particle comprises a core which may be of iron ore and a sealing layer which may be formed of a mixture of clay materials and pozzolanic materials where the clay material may be bentonite clay and the pozzolanic material may be Portland cement.

The examiner states that Nachtman et al also discloses particle sizes and composition ranges broadly encompassing those instantly claimed, and a method of making the particles where the composite particles are formed by contacting the core materials with an aqueous mixture of the sealing layer materials.

The examiner acknowledges that Nachtman et al. does not specifically recite that the core be iron ore and the coating (sealing) layer be bentonite and Portland cement. However, the examiner argues that it has been well settled that where the applied prior art teaches a range of compositions or properties overlapping a claimed range, motivation to select a particular range or value within the range disclosed by the applied prior art would have been a modification obvious at the time the invention was made.

The examiner concludes that since Nachtman et al specifically teaches that iron ore is useful for the core of it's claimed composite particle and that a mixture of clay materials, including bentonite clay, and pozzolanic materials, including Portland cement are useful as the sealing layer of the composite particle, motivation to employ these components as the core and sealing layer materials of Nachtman et al. would have been a modification obvious to one of ordinary skill in the art at the time the invention was made.

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In the section entitled Response to Arguments the examiner rejected applicants' argument that Nachtman is directed to non-analogous art, stating

is not persuasive because none of the claims ever mention or refer to any use of the coated ferrous materials and are directed solely to the coating of ferrous materials with an aqueous mixture of non-hardenable and hardenable materials.

This examiner's statement is contrary to the facts. Applicants draw the examiner's attention to claim 29, which reads as follows

29. (Previously Presented) In a method of reducing the formation of agglomerates of ferrous materials during reduction of such materials by coating the ferrous materials with an aqueous dispersion of a non-hardenable coating, the improvement comprising concurrently coating the ferrous material with a material which hardens in the presence of water.

This is a method claim, in Jepson format. It is precisely what the examiner stated was not present in the case. Its presence directly refutes the examiner's position that there are no claims which "ever mention or refer to any use of the coated ferrous materials ...". In addition to claim 29, the examiner's attention is directed to claims 30 to 32 which expressly refer to "during reduction". The phrase "during reduction" must be read in light of the specification. Doing so makes it unquestionable that "direct reduction" means "direct reduction in a direct reduction furnace".

The use of the claimed materials in the claimed process finds support in the specification at page 2, lines 2, 8-9 and 29 and page 3, lines 6-8 and 23-26.

Thus, claims 29-32 cannot properly be rejected over the art cited by the examiner. Furthermore, since these claims were previously in the case, and were either not properly rejected or are allowable, the final rejection with reference to these claims at least, is premature and should be withdrawn.

Applicants therefore respectfully immediate allowance of these claims or at a minimum, withdrawal of the final rejection as being premature.

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With regard to the remaining claims, Nachman is not only non-analogous art, it also relates to different products having different physical characteristics, as follows:

1. The aim of Nachman et al. is to produce a composite particle formed by a core and a sealant layer that encapsulates the core. This sealant layer when absorbs water must swell to form barrier layer (containing a continuous layer of sealant materials) of low water permeability *to prevent leakage of water and contaminants*- claim 1. By examining Example 1 - see cols. 7-8 - it is very clear to one of ordinary skill that this sealant layer has to be very thick to produce a barrier layer of low permeability (less than 1×10^{-7} cm/s - see claim 2), since the mass of bentonite used to produce the composite particle was 53%, i.e., higher than the mass of the core, and therefore the volume percent of bentonite has to be much higher than 53%. There is no other reference of Nachman et al. to proportions of sealant materials in the composite particles.

The aim of the presently disclosed method is the opposite of Nachman et al. and much more complex. Applicants aim to produce a coating film (see claim 17) on the ferrous core and such coating film can never be like a thick sealant layer because it must be permeable (bentonite, for instance, can not exceed 2%, see claim 24) to allow the entrance of the gas into the ferrous material (when this material is reduced in the direct reduction reactor). On the other hand this coating film must have high strength to resist handling and transportation so that inside the reactor *it prevents the ferrous-ferrous contact* (i.e., core-core contact) during the entire process of reduction of the ferrous material.

2. Nachman et al. include only natural material (gravels) as cores to be sealed.

On the other hand the present application teaches the coating of iron ore pellets or briquettes (see claim 25). It is well known in the art that pellets and briquettes are industrially produced at pelletizing and briquetting plants at temperatures higher than 1100°C and therefore are not natural material.

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3. Nachtman et al. teaches at column 4, lines 40-44, that different quantities of pozzolanic materials should be used in mixtures with clay mineral to create Intermediate hardness barrier layers.

The present application teaches the use of the pozzolanic material to improve the adherence of the non-hardenable coating materials (clay mineral) on the surface of ferrous materials (claim 17) - see example in pages 6-7.

4. Nachtman et al. teaches, at column 4, lines 66-74, that water is a binder used in low quantities to avoid the composite particles becoming sticky, difficult to handle and unflowable.

The present application teaches the use of water as dispersant to prepare the aqueous mixture of the non-hardenable coating materials and a material which hardens in its presence (claim 17). This aqueous mixture is applied on the ferrous material surface (claim 27).

5. Nachtman et al. teaches, at column 4, line 32, that "A pozzolanic material can be used in the sealant layer to create such a hardened barrier layer."

The objective of the present application is not to create a hardened barrier but a hardened coating.

For these reasons the product claims as well are not rendered obvious by the Nachtman et al. reference.

New Claims

New claims 34 - 43 clarify the claimed method by expanding the preamble to more specifically indicate that the method is one for use in a direct reduction furnace. These claims do not require a new search since claim 29 already present in the application is directed to the same subject matter and any search required would have been required by the existing claim[s]. Thus, these claims are appropriate for allowance or further examination in the present application.

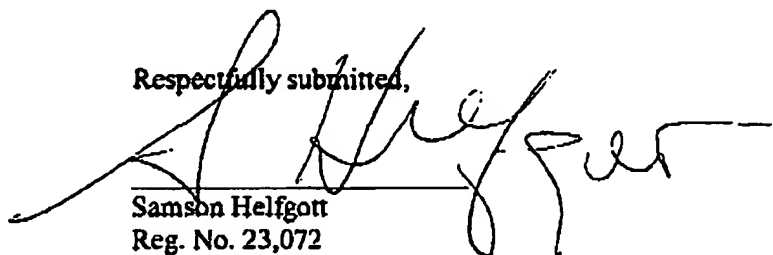
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Conclusion

In view of the foregoing discussion, it is respectfully submitted that the present invention as defined in the pending claims 17 to 32 is in full compliance with all the statutory requirements, and therefore, it is earnestly requested that the Examiner's rejections be withdrawn and the pending claims be allowed in their present form.

Any fee due with this paper, not fully covered by an enclosed check, may be charged on Deposit Account 50-1290.

Respectfully submitted,



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